Memorandum

To: More's Lake CCR File

From: Christian Johanningmeier, PE, Power Production Superintendent

Date: June 10, 2019

Subject: Annual Inspection of CCR Surface Impoundment (40 CFR 257.100(e)(4)(iv))

40 CFR 257.100(e)(4)(iv) requires that an annual inspection of an inactive CCR impoundment must be conducted throughout its operating life. These inspections are focused primarily on the structural stability of the unit and must ensure that the operation and maintenance of the unit is in accordance with recognized and generally accepted good engineering standards. Each inspection must be conducted by a qualified professional engineer.

I conducted an inspection of More's Lake at the City of Columbia's Municipal Power Plant located at 1501 Business Loop 70 E in Columbia, MO. Details of the inspection follow:

1. More's Lake was empty with the exception of less than 1 foot of water at about the middle of the dam. All CCRs have been removed.
2. Work is actively underway to reinforce the waterside slope of the dam. The purpose of the reinforcement is to lessen the slope from about 2:1 to about 3:1 before water is allowed refill the lake. A group of civil engineering students reviewed the dam slope as part of an MU Capstone project during the spring 2019 semester. The students conducted a slope stability analysis and identified suitable materials within the lake bed to use for the reinforcing project.
3. The outlet structure was inspected and consists of an 8" diameter pipe with and elbow turned to elevation 766.50. The outlet structure was in good condition. Rip-rap stone placed around the outlet structure for protection was also in good condition
4. The lake outfall structure was opened and inspected. The outfall is located in a manhole structure near the southwest corner of the dam near the toe. The lake outfall pipe discharges into the manhole. A separate pipe leads north from the manhole and eventually discharges downstream of the dam near I-70.
5. The top of the dam was inspected for any signs of erosion, washouts, animal burrows, vegetation, or any other anomalies. None were found. The top of the dam had a good stand of grassy vegetation that was mowed and in good condition.
6. The face and toe of the dam was inspected for any signs of erosion, washouts, animal burrows, boils, holes, or any other anomalies. None were found. The face of the dam had a good stand of grassy vegetation that was mowed and in good condition. The toe of the dam was largely covered in a gravel parking area for the City of Columbia Public Works department in the southwest quadrant and a Water & Light storage yard in the northwest quadrant.
7. The location of existing piezometers was reviewed and located in the field (refer to Crockett Dam Stability Report dated 7/25/14). All piezometers were located and inspected and found to be in good condition. Water levels were not taken. Also, the locations of the new ground

water monitoring wells were inspected and found to be in good condition. See Burns & McDonnell drawing "Figure 5 Monitoring Well and Bedrock Coring Locations Columbia Municipal Power Plant" for locations. Water levels were not taken.

8. Inspection of the upstream sides of the lake were also inspected. The north, east and south shores of the lake were in good condition but are actively being impacted by the on-going lake restoration project. All of the CCR material has been removed from the lake.
9. Locations where water enters the lake were inspected and are located primarily on the east side of the lake. Three storm water pipes enter the lake. The storm pipe draining from the water storage reservoirs has been impacted by the CCR removal project, and will be extended and replaced. A storm water pipe from the former oil tank reservoir area will eventually be removed as the lake restoration project continues. A new pipe entering the lake from the MPP roof drains has been discovered during the execution of the CCR removal project. This pipe will be extended and retained.
10. The normal discharge from the MPP's deep sewer system has been rerouted to the basins of the out-of-service west cooling towers to reduce the amount of inflow in the Lake to ease the removal of the CCRs.

Christian Johanningmeier, PE – (E-026307)